

**TRANSLATION**

**PATENT COOPERATION TREATY**

**PCT**

**INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY**  
(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference <b>FI-002</b>	FOR FURTHER ACTION	See Form PCT/IPEA/416
International application No. <b>PCT/JP2005/019239</b>	International filing date (day/month/year) <b>19.10.2005</b>	Priority date (day/month/year) <b>31.03.2005</b>
International Patent Classification (IPC) or national classification and IPC <b>H01G9/058, H01G9/016</b>		
Applicant <b>FUJI JUKOGYO KABUSHIKI KAISHA</b>		

1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of \_\_\_\_\_ sheets, including this cover sheet.

3. This report is also accompanied by ANNEXES, comprising:

a. ☒ (sent to the applicant and to the International Bureau) a total of 2 sheets, as follows:

☒ sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).

☐ sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.

b. ☐ (sent to the International Bureau only) a total of \_\_\_\_\_, containing a sequence listing and/or tables related thereto, in electronic form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).

4. This report contains indications relating to the following items:

<input checked="" type="checkbox"/>	Box No. I	Basis of the report
<input type="checkbox"/>	Box No. II	Priority
<input type="checkbox"/>	Box No. III	Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
<input type="checkbox"/>	Box No. IV	Lack of unity of invention
<input checked="" type="checkbox"/>	Box No. V	Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
<input type="checkbox"/>	Box No. VI	Certain documents cited
<input type="checkbox"/>	Box No. VII	Certain defects in the international application
<input type="checkbox"/>	Box No. VIII	Certain observations on the international application

Date of submission of the demand	Date of completion of this report
Name and mailing address of the IPEA/JP	Authorized officer
Facsimile No.	Telephone No.

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/JP2005/019239

Box No. I Basis of the report

1. With regard to the language, this report is based on:

- ☒ the international application in the language in which it was filed
- ☐ the translation of the international application into \_\_\_\_\_, which is the language of a translation furnished for the purposes of:
- ☐ international search (Rule 12.3(a) and 23.1(b))
- ☐ publication of the international application (Rule 12.4(a))
- ☐ international preliminary examination (Rule 55.2(a) and/or 55.3(a))

2. With regard to the elements of the international application, this report is based on (replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report):

- ☐ the international application as originally filed/furnished
- ☒ the description:

pages 1-3, 5-32 as originally filed/furnished

pages\* 4 received by this Authority on 31.05.2006

pages\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_

- ☒ the claims:
- nos. 2-9 as originally filed/furnished

nos.\* \_\_\_\_\_ as amended (together with any statement) under Article 19

nos.\* 1 received by this Authority on 31.05.2006

nos.\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_

- ☒ the drawings:
- sheets figures 1-6 as originally filed/furnished

sheets\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_

sheets\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_

- ☐ a sequence listing and/or any related table(s) - see Supplemental Box Relating to Sequence Listing.

3. ☐ The amendments have resulted in the cancellation of:

- ☐ the description, pages \_\_\_\_\_
- ☐ the claims, nos. \_\_\_\_\_
- ☐ the drawings, sheets/figs \_\_\_\_\_
- ☐ the sequence listing (specify): \_\_\_\_\_
- ☐ any table(s) related to sequence listing (specify): \_\_\_\_\_

4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).

- ☐ the description, pages \_\_\_\_\_
- ☐ the claims, nos. \_\_\_\_\_
- ☐ the drawings, sheets/figs \_\_\_\_\_
- ☐ the sequence listing (specify): \_\_\_\_\_
- ☐ any table(s) related to sequence listing (specify): \_\_\_\_\_

\* If item 4 applies, some or all of those sheets may be marked "superseded."

## INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/JP2005/019239

**Box No. V** Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

## 1. Statement

Novelty (N)

Claims 1 - 9

YES

Claims

NO

Inventive step (IS)

Claims

YES

Claims

1 - 9

NO

Industrial applicability (IA)

Claims

1 - 9

YES

Claims

NO

## 2. Citations and explanations (Rule 70.7)

Document 1: WO 2003/003395 A1 (Kanebo, Ltd.), 09 January 2003, entire text, Fig. 1-3 & US 2004/179328 A & EP 1400996 A1

Document 2: JP 2003-217986 A (Meidensha Corp.), 31 July 2003, paragraphs [0013], [0014], Fig. 2

Document 3: JP 11-260673 A (The Kansai Coke and Chemicals Co., Ltd.), 24 September 1999, paragraph [0009], Fig. 5

Document 4: JP 11-297578 A (Mitsubishi Chemical Corp.), 29 October 1999, entire text, Fig. 1

Claims 1-4, 6, 7, 9

Document 1 describes a lithium ion capacitor comprising a positive electrode, a negative electrode, and an aprotic organic solvent solution (propylene carbonate, etc.) of a lithium salt ( $\text{LiPF}_6$ ) as an electrolyte solution, in which the positive electrode active material is a substance capable of reversibly carrying lithium ions and anions (a polyacen-type organic semiconductor (PAS), etc. that is a thermally treated aromatic condensed polymer (phenol resin) and has a polyacen-type skeletal structure with atomic ratio of hydrogen atoms/carbon atoms 0.22), and the negative electrode active material is a substance capable of reversibly carrying lithium ions (a polyacen-type organic semiconductor (PAS), etc. that is a thermally treated aromatic condensed polymer (phenol resin) and has a polyacen-type skeletal structure with atomic ratio of hydrogen atoms/carbon atoms 0.21). In this lithium ion capacitor, the positive electrode assembly and negative electrode assembly are provided with holes penetrating the front and back respectively; a staked unit is configured by alternately stacking positive electrodes and negative electrodes via separators; a lithium ion supply source is appropriately disposed above and below or in the middle of the staked unit; the lithium ion supply source is formed by pressing and adhering lithium metal foil to both faces of a collector (stainless steel mesh, etc.) which is provided with holes penetrating the front and back; lithium ions are carried by the negative electrode in advance by connecting the lithium ion supply source and the negative electrode; the negative electrode active material has an electrostatic capacitance per unit weight that is 3× or more that of the positive electrode active material; and the weight of the positive electrode active material is larger than the weight of the negative electrode active material.

In this case, the lithium ion capacitor described in Document 1 uses the same positive electrode active material and negative electrode active material as the invention of the present application, connects the negative electrode and lithium metal, and the negative electrode carries lithium in the amount of 350-500 mAh/g, which is about the same as the examples of the present application (equivalent to 400 mAh/g) relative to negative electrode active material mass. Therefore, the potential of the positive electrode after short-circuiting the positive electrode and negative electrode can be interpreted as 2.0V or less.

## Supplemental Box

In case the space in any of the preceding boxes is not sufficient.

Continuation of: BOX V.2

Document 2 describes art in which a capacitor unit (electrode unit) is configured in advance by alternately stacking positive electrodes and negative electrodes via separators, and two or more of these capacitor units are stacked to configure a capacitor module (equivalent to a "cell").

Thus, employing the art described in Document 2 in the lithium ion capacitor described in Document 1 and stacking two or more of the lithium ion capacitor stacked units described in Document 1 to configure a capacitor module and obtain the inventions set forth in claims 1-4, 6, 7, and 9 could easily be conceived of by a person skilled in the art.

Consequently, the inventions set forth in claims 1-4, 6, 7, and 9 do not involve an inventive step.

#### Claim 5

Document 1 (Fig. 2) describes the art of electrode disposition such that a separator is disposed at the outermost part and a negative electrode is disposed inside that. Employing such an electrode disposition as the configuration of an electrode unit is within the scope of a design matter that can be appropriately performed by a person skilled in the art.

Consequently, the invention set forth in claim 5 does not involve an inventive step.

#### Claim 8

In electric double-layer capacitors, etc., using tape to close and bind the outside of an electrode unit which is formed by alternately stacking positive electrodes and negative electrodes via separators is well-known art, as described in Document 3, for example. Therefore, employing the art described in Document 2 and this well-known art in the lithium ion capacitor described in Document 1 and obtaining the configuration of the invention set forth in claim 8 could easily be conceived of by a person skilled in the art.

Consequently, the invention set forth in claim 8 does not involve an inventive step.

Also, because the invention set forth in claim 1 is the invention of a substance – a "lithium ion capacitor", when electrode units are configured in advance and these are stacked to configure a cell and when a cell is configured by alternately stacking positive electrodes and negative electrodes via separators without configuring an electrode unit, there is no different in the completed "lithium ion capacitor" as the invention of an object.

Also, in a capacitor which uses an aprotic organic solvent solution of a lithium salt, adjusting the natural potential by causing positive electrodes and negative electrodes to carry lithium ions is described in Document 4.